

JOB NO.: IGS03-F W.O. #XX-XXXX-X

TITLE: Unit 2 Burner Modifications

DESCRIPTION: Install modified burners, utilizing the existing nozzles.

JUSTIFICATION: Economic

<u>RATE OF RETURN:</u>	18 %
<u>PAYBACK PERIOD:</u>	1 year
<u>BENEFIT/COST RATIO:</u>	1.24
<u>ECONOMIC LIFE:</u>	20 years
<u>PV SAVINGS:</u>	\$1,091,331

ADDITIONAL DETAIL: To maximize the advantage of the boiler and turbine uprates, the burners must have fully functional controls. The modified burners that are proposed, will fulfill this requirement.

The present burners have heat-deformed components and bound up linkages which do not allow for full functional control. The total cost of repairing the existing burners is approximately 80% (\$3.5M) of the cost of installing new modified burners (\$4.5M). In addition, the time required to remove the existing burners, make the needed repairs and then to reinstall the burners, would exceed the time allotted for the outage. This would require extending the outage by approximately 5 to 10 days.

In addition to the cost savings of installing the modified burners, the new burners will aid in future NOx reductions, should this be required.

12

COST ESTIMATE:

	<u>2003-2004</u>
Engineering Labor	\$10,000
IPSC Labor	\$10,000
Contractor Labor	\$1,480,000
Material	<u>\$3,000,000</u>
Job Total	\$4,500,000

EFFECT OF DEFERRAL: The inability to fully operate some of the burner controls for improved performance of the unit uprate.

DETAILS OF ECONOMICS: Economic assumptions:

1. Economic life: 20 years
2. Estimated cost of existing burner repairs: \$3,494,000
3. Cost of money: 6.04 percent
4. Cost of generation: \$25.00/MW hr
5. Days Outage would be extended for existing burner repairs: 3 days (Possibly 5 to 10 days).
6. Avoided cost of maintenance during each future outage: \$36,000

PROJECT HISTORY: The required work on the burners has been increase in priority with the planned unit uprates.

### IGS03 - F Unit 2 Burner Modifications Economic Justification Calculations

#### Summary

PV of Project Savings

Benefit/Cost Ratio

Payback Period

Total Return

Internal Rate of Return

This was calculated by shifting Time=0 savings to the 1 year

Initial Capital Expenditures w/Project (-\$)	\$ (4,500,000)	This is the cost of completing the capital project. Outgoing money is negative.
Initial Capital Savings w/Project (+\$)	\$ 5,069,000	This is the immediate (Time = 0) savings that the capital project will create. Incoming (i.e. saved) money is positive.
Total Initial Capital Savings or Costs w/Project (+/- \$)	\$ 569,000	This is the net gain or loss of money at Time = 0, if the capital project is completed.
Annual Expected Maintenance Expenses w/Project (-\$)	\$ (36,000)	This is the annual maintenance costs that are expected after the capital project is completed.
Annual Maintenance Expenses w/o Project (-\$)	\$ (72,000)	This is the annual maintenance costs that are occurring without the capital project.
Annual Maintenance Savings w/Project (+/- \$)	\$ 36,000	This is the annual net gain or loss of money if the project is completed.
O & M Escalation (%)	3	
Cost of Capital (%)	6.04	

Time Period	Capital	PV Capital	Annual Maint Savings w/Esc	PV Maint Costs
Capital at Time = 0				
0	\$569,000	\$569,000		\$(4,500,000)
1			\$36,000	\$33,949
2			\$37,080	\$32,976
3			\$38,192	\$32,031
4			\$39,338	\$31,113
5			\$40,518	\$30,221
6			\$41,734	\$29,354
7			\$42,986	\$28,513
8			\$44,275	\$27,695
9			\$45,604	\$26,901
10			\$46,972	\$26,130
11			\$48,381	\$25,381
12			\$49,832	\$24,653
13			\$51,327	\$23,947
14			\$52,867	\$23,260
15			\$54,453	\$22,593
16			\$56,087	\$21,945
17			\$57,769	\$21,316
18			\$59,503	\$20,705
19			\$61,288	\$20,112
20			\$63,126	\$19,535
Present Value Totals	-	-	-	\$19,535

**Breakdown of the Values Used in the Above Calculations**Internal Rate of Return  
Guess

1

## Initial Capital Expenditures w/Project

Engineering Labor	\$ 10,000
IPSC Labor	\$ 10,000
Contract Labor	\$ 1,480,000
Material	\$ 3,000,000
Total	<u>\$ 4,500,000</u>

## Initial Capital Savings w/Project

Days Saved By Not Extending the Outage	3
Costs Per MWhr of Lost Generation (\$/hr)	25
Generation Lost (MW)	<u>875</u>
	\$ 1,575,000

## Alternative Costs to Repair Burners

Labor	\$ 1,900,000
Material	\$ 1,594,000
	<u>\$ 3,494,000</u>